Strategies for reducing outpatient waiting times in urban public hospitals in Lusaka, Zambia: A Cross-Sectional Study

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ABSTRACT

Delays in outpatient waiting times are one of the major barriers to health system performance and patient satisfaction in the low- and middle-income countries. In Lusaka, Zambia, there is still endemic congestion and inefficiencies within the functioning of the first-level hospitals in the country. In order to research these phenomena, a cross-sectional study was conducted at Kanyama and Chilenje First-Level Hospitals, where 410 adult outpatients were selected through the simple random sampling method. Queuing theory guided the study. These quantitative findings are just a portion of a large mixed study that aimed at developing an operational framework for optimizing outpatient waiting time in public health facilities in Zambia. A designed questionnaire was used to gather the information on demographics, service-point waiting time, patient perceptions, and factors with regard to management. Descriptive and inferential statistical analyses were implemented in SPSS v26 and responses given in open-ended format to thematic coding, respectively. Almost half (46.13%) of the respondents have waited between 3 and 6 hours, with the longest waiting time at the reception, triage, and pharmacy. The shortage in human resources, especially when the restaurant is facing peak times, as well as insufficient infrastructure, has turned out to be the effective predictor of long waiting times. Even though 82 percent of the facilities stated the use of an appointment system, most visits (72 percent) were walk-ins, meaning little use of scheduling tools. The measures that were confidently supported by patients included additional staffing during the busy hours, the task-shifting towards nurses in case of routine consultations (90.7%), and the introduction of the triage and appointment systems (more than 80). A willingness to repeat the same facilities was mentioned by only 31% of patients, and their reasons were long queues, bad coordination, and slow service delivery. Generally, the systemic inefficiencies, low capacity of the staff, and lack of infrastructure are the major causes of outpatient delays in the public hospitals of Lusaka. To effectively reduce outpatient waiting times, strategic efforts should prioritize workforce optimization, improvement of triage and appointment mechanisms, digitalization of patient registration through SmartCare, and expansion of healthcare infrastructure. Embedding these initiatives within Zambia's broader health systems management and e-health frameworks is likely to yield substantial improvements in service delivery efficiency, patient satisfaction, and overall trust in the public health system.

Keywords: Lusaka, Outpatient Waiting Time, Patient Satisfaction, Strategies, Triage, Zambia

1. INTRODUCTION

Healthcare outpatient waiting time is one of the indicators of efficiency and responsiveness in the health system that are most commonly cited. This measure focuses on the total period of time that a patient spends before care can be administered to him or her, taking in to consideration the time spent at the triage, during the consultation, laboratory and pharmacy times among other facilities. According to the World Health Organization, long waiting times adversely affect the quality of care and delay diagnosis and treatment in addition to the patient satisfaction (Redhead, 2021).

Prolonged wait times have been an endemic problem in Zambia, especially in first-level hospitals in Lusaka where most of the population-over 3.3 million, an urbanization rate of 4.15percent per year (Ministry of Health, 2021) depends on the state health service. Routine patient outpatient traffic in the hospital is an average of 500-1000 patients in a day, which leads to a phenomenon of crowding the reception areas, waiting bays and wonted waiting lines in consultation and pharmacy zones (Zafar et al., 2024). Even after such interventions as triage systems, extra staffing, and appointment scheduling, the patients in Lusaka tend to spend three to six hours in the outpatient departments.

The majority of outpatient service delivery delays are systemic and infrastructure-related, indicating ingrained inefficiencies in medical institutions. Staff shortages, insufficient consultation spaces, and ineffective registration processes all contribute to congestion in clinics and hospitals and impede efficient patient flow (Musey et al., 2021). Longer wait times are caused by a shortage of healthcare personnel compared to the number of patients, and bottlenecks

caused by a lack of consultation rooms force patients to wait a lengthy time before obtaining care. These structural limitations exacerbate the inefficiency of healthcare operations by slowing service delivery and putting more burden on current employees (Ministry of Health, 2021).

In addition to infrastructure difficulties, poor registration processes play a crucial role in outpatient delays. Many institutions still use manual record-keeping or obsolete administrative systems, which are prone to mistakes and delay overall operations. Patients frequently face repeated verification processes, missing documents, or extended processing times, which adds to their irritation and worry(Aeenparast et al., 2019). The dependence on these inefficient approaches impedes timely access to treatments and leads to a sense of disorganisation within the healthcare system. Such procedural delays highlight the importance of efficient, automated registration solutions that may eliminate redundancies and increase patient throughput (Musey et al., 2021).

These systemic and procedural factors collectively result in patient dissatisfaction and reduced quality of care. Patients frequently report intolerable wait times, with overcrowding, poor coordination among departments, and slow service delivery identified as primary sources of frustration (Zafar et al., 2024). The cumulative effect of these challenges is a healthcare environment where access is delayed, patient expectations are unmet, and overall service quality is compromised. Addressing these issues requires comprehensive interventions targeting both infrastructural improvements and process optimization to enhance efficiency, patient experience, and satisfaction within outpatient services(Mostafa et al., 2020).

This study concentrated on tracking outpatient waiting times objectively and figuring out the infrastructure and systemic causes of these delays. This involved gathering numerical data on staff availability, patient flow, and service point congestion in addition to examining delay trends in various departments. These results are part of a broader mixed-methods study that also includes qualitative evaluations of patient experiences and views. The quantitative results offer evidence-based insights that can direct hospital administrators, legislators, and healthcare providers in implementing focused interventions to decrease delays and enhance operational efficiency by separating the quantifiable components of waiting times and service inefficiencies**.**

1.1 Statement of the Problem

The long outpatient waiting lines have been a chronic challenge to quality healthcare delivery in most of the low- and middle-income countries (LMICs). The most studies on waiting time have reported that, excess waiting times impair service efficiency, encourage patients to be unhappy with the service, and prevent timely healthcare-seeking habits. Research in sub-Saharan Africa such as Ghana, Nigeria, and Kenya indicate that more than three out of five patients are dissatisfied with waiting longer than two hours before being served (Villegas et al., 2021)

The problem of chronic overcrowding is observed in urban public hospitals in Zambia (in the metropolis of Lusaka), where the number of outpatients reaches 500-1,000 patients per day (Ministry of Health, 2021). Amid several attempts to reform the system (which include triage systems and digital record initiatives like SmartCare), there are still three to six-hour wait times in the first-level hospital (Hamoonga et al., 2024). A study done by Sialubanje et al. (2023) stated that, uunderstaffing, insufficient consultation space, manual registration, and absence of organization system in making appointments continue to pressure service delivery.

Although the world has suggested several possible operational and policy remedies such as appointment scheduling, task-shifting, and queue-management systems (MacLean et al., 2025), the adaptation of these within the system of the Zambian State has not been incorporated into a whole. However, empirical data at a patient level on the best management strategies to be used in enhancing responsiveness in service delivery are inadequate. This gap indicates necessity of evaluating the patient and system approach management to patient perceptions, in order to maximize the waiting time at outpatient services in the urban public hospitals in Lusaka.

1.2 Research Objective

To assess the health systems management practices to minimize outpatient waiting times in urban Lusaka public hospitals on the perspective of patients.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Queuing Theory

A mathematical framework called queuing theory is used to examine waiting lines and service systems, concentrating on factors including arrival rates, service rates, and the quantity of service channels (Biya *et al*, 2022). It clarifies how staff availability, patient flow, and service capacity interact to cause delays in the context of outpatient services. Healthcare administrators may anticipate bottlenecks, maximise staffing, and shorten patient wait times by utilising queueing theory. This theory has been used in studies on outpatient waiting times to model patient arrivals and

service procedures. The results show that uneven patient arrivals and inefficient resource allocation are significant causes of extended waiting, which serves as a foundation for interventions to expedite service delivery.

2.2 Empirical Review

Waiting time refers to the amount of time during which a person has been staying in a medical institution before being seen or receiving care (Shokouhifar & Ranjbarimesan, 2022). It is normally subdivided into the following: registration, triage, consultation, laboratory, pharmacy and discharge. Researchers distinguish waiting time that can be objectively measured and waiting time that is perceived, the latter being closely linked to the satisfaction of the patients (Kalwar et al., 2021). Perceived wait time can at other times have more impact on dissatisfaction as compared to objective delays because psychological factors like uncertainty, anxiety and communication deficit will lead to dissatisfaction (Biya et al., 2022).

Patient satisfaction is a complex phenomenon that includes accessibility, timeniness, interpersonal relationships, and perception of quality (Almeida et al., 2021). The fact that the relationship between extended waiting periods and satisfaction is negative has been widely demonstrated (Bolton Moore et al., 2020; Biya et al., 2022). On the same note, in Nigeria observed that the wait time was among the most important predictors of the low outpatient care ratings(Burgoyne et al., 2020).

In high-income institutions where the waits are long, the waits are not satisfactory but the average wait is also shorter (15.45 min). Ukonu *et al.* (2024) have proven that even small shifts in patient waiting time in the United States were correlated with negative change in patient satisfaction Population. These results demonstrate that waiting time has a prevalent influence on the perception of the quality of healthcare, and the effect is even stronger in the circumstances when resources are limited. How individuals establish their health needs, how they assess the available care options and how they determine whether to seek care or not is the health-seeking behavior (Sialubanje et al., 2023). Based on the Andersen Behavioral Model, the factors that determine the utilization of healthcare include predisposing factors, enabling factors, and need factors. Waiting time is one of the enabling, systems level factors that have a direct impact on patient decisions on using or not using services.

The findings of empirical studies in sub-Saharan Africa confirm that waiting time is a deterrent to timely care-seeking behavior and patients resort to finding alternative services to replace this behavior. Moshabela et al. have shown that patients in South Africa are inclined to drop the trip to the existing facilities preferring to resort to pharmacies and traditional healers in case of the long delays. Similarly, in Zambia, Sialubanje et al. (2023) have determined that potentially too long waiting times in the facility stimulated women to prefer traditional birth attendants to formal ones. Such results testify to the fact that waiting times are not only a cost of satisfaction but also a factor of healthcare consumption.

Prolonged waiting times are systemic due to the lack of workforce, especially in low- and middle-income countries and the unoptimization of patient-flow, poor triage, and lack of a referral system (Oladele et al., 2020). Furthermore, the lack of outpatient appointment scheduling, as well as the electronic medical records, is another technological constraint and one of the causes of congestion of outpatient divisions (Biya et al., 2022).

Comparative studies also focus on the effectiveness of operational innovations; introduction of appointment systems and electronic queue management in Uganda and Tanzania significantly shortened the waiting time (Beck *et al*, 2021). These interventions show that even small modifications to the system can result in a great efficiency boost in the resource-limited environment.

The outpatient department waiting time in the Zambian health facilities is indicative of chronic overcrowding especially in the urban areas. Lusaka reported the waiting time of 2-6 hours in outpatients, which is significantly higher than the global indices (MacLean et al., 2025).Sialubanje *et al*. (2023) focused on the shortcomings in the referrals system that had overburdened the tertiary hospitals with cases that could be handled at the primary hospitals. Bottlenecks in triage and consultation were established by Musey *et al* (2021) to be the causes of delays in tertiary hospitals. Waiting time issues have been mentioned numerous times in performance reviews published annually by the Ministry of Health (2021) as elements that cause patient dissatisfaction and loss (Ministry of Health, 2021).

However, these studies as well as exquisitely define the extent of the issue, not many of them directly corroborate waiting time with patient satisfaction and subsequent health-care use in Zambia. This is a testimony to the necessity of empirical research, including the current study, in order to distinguish the direct influence of waiting time factor on the satisfaction levels and utilization rates in the first-level hospitals in Lusaka.

III. METHODOLOGY

3.1 Research Design

The research design was a cross-sectional study design with a qualitative. This method allowed the measurement of outpatient waiting time in the first-level hospitals, the systemic, infrastructural, and staffing-related variables, and the perception of the patients waiting time and also establish predictors through the use of regression analysis.

3.2 Research Setting

The study was carried out at Kanyama First-Level Hospital and Chilenje First-Level Hospital in Lusaka District, Zambia; high-volume public health facilities with high density in terms of their catchment and routinely faced overcrowding of outpatient departments (OPDs). They were intentionally chosen as sites of the first level hospital activities with large patient volumes.

3.3 Population and Eligibility Criteria.

The population of interest was adult outpatients aged 18 years and above who were in the selected hospitals during the period of conducting the research. The members had to be a person who was eligible to receive service, including consultations, follow ups, referrals, laboratory tests or pharmacy refills. All the consenting adults (dispersing 18 years), who attended OPDs in the data-collection period, were eligible and were later recruited into the study. Those who only provided the emergency services, patient with severe conditions, who could not communicate, and minor children without a legal guardian were excluded.

3.4 Sample Size and Sampling Procedure.

The sample size of 422 outpatients was estimated to have followed standard formulas of cross-sectional surveys and a 95% confidence level and 5 margin of error. This calculation was done to have enough power to represent variability in waiting times and possible non-response. The true population of the sample was 384, and 410 questionnaires were filled and considered valid enough to analyze them, which presented a 97.2 percent response rate. Derivation of the sample size is illustrated as below.

$n=(z)^2p(1)\ d^2$

Where:

n = sample size

z = Z score at a confidence level of 95% (equal to 1.96)

p = estimated proportion of the population with the characteristic of interest (assumed to be 0.5 for maximum variability, as the true proportion was unknown)

d = margin of error (set at ±5%) Substituting the values into the formula: $n = (1.96)^2 \times 0.5 \times (1-0.5) / (0.05)^2$

n = 384.16

10% was calculated as provision for non-response.

Which ultimately came to 422

A stratified sampling approach was employed to enhance representativeness and minimize bias.

3.5 Data Collection Tool

The collection of data was done with the use of a structured, pre-tested questionnaire. This instrument consisted of three parts. The questionnaire was piloted in an establishment of a similar size so as to make it clear, reliable and content valid.

3.6 Data Collection Procedure

The questionnaires were administered by trained research assistants using face-to-face interviews after getting the informed consent. The data collection was done in outpatient waiting departments.

3.7 Data Analysis

All data were entered, cleaned and SPSS version 26 was used to analyse. The demographic data, waiting periods, and perception were summarised by descriptive statistics. Various tables presented the means, medians, frequencies and percentages based on the nature of the variable. The inferential statistics were used to test the relationships among waiting times and independent variables.

3.8 Ethical Considerations

The research was ethically approved by the Biomedical Research Ethics Committee of the University of Zambia (UNZABREC). The analytics clearance was obtained with the Lusaka District Health Office and the management of the sampled hospitals. Each participant gave an informed consent in written form. The privacy of information was also maintained by avoiding the gathering of personally identifying information and secure storage of all information. Participation was voluntary and the respondents were made aware that they could withdraw themselves at the will of the study without any penalty.

IV. FINDINGS & DISCUSSION

4.1 Findings

This section describes the socio-demographic characteristics of the respondents to the research. Understanding these features is critical because they add context to the findings and help explain differences in reactions and outcomes. Age, gender, marital status, education level, employment, and other demographic parameters were examined. These characteristics are critical for evaluating the study's findings because they may impact perceptions, experiences, and behaviours regarding outpatient waiting times in public health facilities.

Table 1

Socio-Demographic Characteristics of Respondents (N = 410)

Variables	Category	Frequency	Percent
Age	Below 18 Years	79	19.3
	18–25 Years	104	25.4
	26–35 Years	140	34.1
	36–45 Years	40	9.8
	46–55 Years	36	8.8
	Above 66 Years	11	2.7
	Total	**410**	**100.0**
Marital Status	Married	159	38.8
	Single	179	43.7
	Divorced	26	6.3
	Separated	46	11.2
	Total	**410**	**100.0**
Education Level	Secondary Education	194	47.3
	No Education	15	3.7
	Postgraduate Education	37	9.0
	Tertiary Education (College/University)	143	34.9
	Primary Education	21	5.1
	Total	**410**	**100.0**
Employment Status	Unemployed	96	23.4
	Self-employed (Informal)	149	36.3
	Employed (Formal)	129	31.5
	Student	25	6.1
	Retired	11	2.7
	Total	**410**	**100.0**

Table 1. Most of the respondents were women (62.4%), and the average age was of around 34 years. The study also revealed that, almost half (47.3) were educated to secondary level and 29.5% were educated to primary level and 23.2% to tertiary level. Majority participants were married (58.0%). In terms of education level, over half (47.3%) had completed secondary school, 34.9% had completed higher education (college or university), 9.0% had postgraduate credentials, 5.1% had completed elementary school, and 3.7% had no formal education. In terms of job status, the majority, 36.3% were self-employed in the informal sector.

4.2 Services Point Waiting Time

This study assessed the average waiting time at various service points within the selected facilities. Table 2 provides a summary of the mean waiting times observed at each service point.

Table 2
Service Point Waiting Time

Service Stage	Time Category	Frequency	Percentage (%)
Triage Waiting Time	Less than 30 minutes	75	18.3%
	30 minutes–1 hour	239	58.3%
	1–2 hours	78	19.0%
	More than 2 hours	18	4.4%
	Total	**410**	**100.0%**
Reception Turnaround Time	Less than 10 minutes	61	14.9%
	10–30 minutes	191	46.6%
	31–60 minutes	139	33.9%
	More than 60 minutes	19	4.6%
	Total	**410**	**100.0%**
Consultation Waiting Time	Less than 5 minutes	33	8.0%
	5–10 minutes	110	26.8%
	10–15 minutes	172	42.0%
	More than 15 minutes	95	23.2%
	Total	**410**	**100.0%**
Laboratory Turnaround Time	Not Applicable	177	43.2%
	Less than 30 minutes	61	14.9%
	30 minutes–1 hour	93	22.7%
	1–2 hours	52	12.7%
	More than 2 hours	27	6.6%
	Total	**410**	**100.0%**
Pharmacy Turnaround Time	Not Applicable	50	12.2%
	Less than 10 minutes	65	15.9%
	10–30 minutes	190	46.3%
	30–60 minutes	100	24.4%
	More than 60 minutes	55	13.4%
	Total	**410**	**100.0%**
Other Services (Estimated)	Not Applicable	70	17.1%
	Less than 15 minutes	120	29.3%
	15–30 minutes	170	41.5%
	More than 30 minutes	50	12.2%
	Total	**410**	**100.0%**

For triage waiting time, the majority of patients (239, or 58.3%) waited between 30 minutes to 1 hour, followed by 78 patients (19.0%) who waited 1 to 2 hours. A smaller proportion 75 patients (18.3%)—waited for less than 30 minutes, while 18 patients (4.4%) reported waiting more than 2 hours. These figures suggest moderate performance in triage, though delays remain for a significant subset. Regarding reception turnaround time, 191 patients (46.6%) were processed within 10–30 minutes, and 61 (14.9%) were attended to in less than 10 minutes. However, 139 patients (33.9%) experienced waits of 31–60 minutes, while 19 (4.6%) reported delays of more than an hour, indicating room for efficiency improvement at the initial contact point.

Consultation waiting time data shows that 172 patients (42.0%) waited 10–15 minutes, and 110 (26.8%) were attended to within 5–10 minutes. Only 33 (8.0%) were seen in less than 5 minutes, whereas 95 patients (23.2%) endured waits of more than 15 minutes, showing that a quarter of patients still faced extended delays before consultation. The laboratory turnaround time indicates significant variability. While 93 patients (22.7%) received results within 30 minutes to 1 hour, and 61 (14.9%) in less than 30 minutes, 52 (12.7%) waited 1–2 hours, and 27 (6.6%) had delays beyond 2 hours. Notably, 177 patients (43.2%) did not require laboratory services, reflecting the clinical variation in outpatient visits.

4.3 Appointment Booking System, Type of Visit Schedule and Pre-Book Method

In order to maximise patient flow and shorten wait times in medical facilities, effective outpatient appointment management is essential. It is cardinal to state that, how well patients are attended to upon arrival is determined by the pre-book technique, the kind of visit schedule, and the appointment booking system. These elements serve as the foundation for the provision of healthcare services, impacting not just overall service quality and patient happiness but

also operational efficiency. This section presents appointment Booking System, Type of Visit Schedule and Pre-Book Method.

Table 3

Appointment Booking System, Type of Visit Schedule and Pre-book Method

Variable	Response Category	Frequency	Percent (%)	Cumulative Percent (%)
Appointment Booking System	Yes	337	82.2	82.2
	No	73	17.8	100.0
	Total	**410**	**100.0**	—
Type of Visit Schedule	Walk-in	296	72.2	72.2
	Pre-booked	56	13.7	85.9
	Referral	58	14.1	100.0
	Total	**410**	**100.0**	—
Pre-book Method	Not Applicable	304	74.1	74.1
	In Person	106	25.9	100.0
	Total	**410**	**100.0**	—

Among the 410 responses, 337 (82.2%) replied that facilities have have an appointment booking system with 73 (17.8%) being in a position to say otherwise. In relation to the kind of visit schedule, 296 participants (72.2%) said that they were walk-ins without prior scheduling, 56 (13.7%) had scheduled their appointments before, and 58 (14.1%) were referred to their facility. In the method of pre-booking, there were 304 respondents (74.1%) who said that this does not apply to them and 106 (25.9%) have booked their visit personally.

4.4 Strategies to Reduce Outpatient Waiting Time

This section includes strategies recommended by patients to reduce outpatient wait times. It focuses on identifying both institutional and operational measures that can improve service efficiency, streamline patient flow, and optimize resource utilization within the hospitals. The goal is to find institutional and operational measures that help enhance service efficiency and patient flow management.

Table 4

Strategies to Reduce Outpatient Waiting Time

Strategy	Yes (n, %)	No (n, %)
Appointment booking system (online or in-person)	337 (82.2%)	73 (17.8%)
Triage system to prioritize urgent cases	348 (84.9%)	62 (15.1%)
Additional staff during peak hours	392 (95.6%)	18 (4.4%)
Task-shifting (e.g., nurses handling routine consultations)	372 (90.7%)	38 (9.3%)
Separate fast-track lanes for minor ailments	338 (82.4%)	72 (17.6%)
Health education/entertainment while waiting	288 (70.2%)	122 (29.8%)
Digital queue management or token system	100 (24.4%)	310 (75.6%)
SMS alerts for appointment reminders	280 (68.3%)	130 (31.7%)
Feedback mechanism for reporting delays	81 (19.8%)	329 (80.2%)
Close supervision of healthcare providers	92 (22.4%)	318 (77.6%)

The study indicated that the majority of respondents strongly support human-resource-related interventions. Specifically, 95.6% (n = 392) of participants emphasized the need for additional staff during peak hours, while 90.7% (n,372) stated that task-shifting strategies such as nurses managing routine consultations to ease clinician workload. On the other hand, patient sited SMS alerts for appointment reminders as one of the key strategies, this is evident by 68.3% (n = 280) response rate, while only 24.4% (n = 100) advocated for digital queue management systems, indicating lower acceptance of advanced technology solutions.

4.5 Statistical comparison of Outpatient Waiting Time by type of visit scheduled Categories

This section provides a statistical comparison of outpatient waiting times for various appointment schedules, including walk-in, pre-booked, and referral. The purpose of this investigation was to see if the kind of visit scheduling had a substantial impact on how long patients waited before obtaining medical treatment. To do this, the data were first examined for normality and variance homogeneity before using the relevant statistical tests. Because the data did not

follow the assumptions of normal distribution and equal variances, a non-parametric Kruskal-Wallis test was employed to compare median waiting times among groups. Pairwise comparisons were then conducted to see if individual groups varied substantially from one another.

Table 5

Test of Normality and Homogeneity of Variance: Outpatient Waiting Time by Type of Schedule Visit

Type of Visit Schedule		Kolmogorov-Smirnov[a]			Shapiro-Wilk			Levene's test
		Statistic	df	Sig.	Statistic	df	Sig.	Sig: 0.05
Outpatient Waiting Time	Walk-in	0.277	296	0.000	0.787	296	0.000	
	Pre-booked	0.504	56	0.000	0.425	56	0.000	
	Referral	0.263	58	0.000	0.774	58	0.000	

Table 5 shows the findings of the Kolmogorov-Smirnov, Shapiro-Wilk, and Levene tests were used to determine the normality and homogeneity of variance in outpatient waiting time data across the three visit schedule types. The Kolmogorov-Smirnov and Shapiro-Wilk tests showed significant findings ($p < 0.05$) for all groups (walk-in, pre-booked, and referral), showing that the distribution of waiting times departed considerably from normality. The Levene's test for variance equality was significant ($p < 0.05$), indicating a violation of the assumption of variance homogeneity. These findings supported the use of a non-parametric statistical test (Kruskal-Wallis) to compare median waiting times between groups, rather than parametric approaches like ANOVA.

Table 6

Independent-Samples Kruskal-Wallis Test: Outpatient Waiting Time by Type of Visit Schedule

Total Number	410
Test Statistic	46.438[a]
Degree of Freedom	2
Asymptotic Sig. (2-sided test)	0.000

Table 6 summarises the findings of the Kruskal-Wallis test, which was used to establish if there were statistically significant differences in outpatient wait times across the three scheduling options. The test consisted of 410 observations with 2 degrees of freedom. The Kruskal-Wallis test ($\chi^2 = 46.438$, $p = 0.000$) revealed a significant difference in median waiting time across the groups. This implies that the kind of visit scheduling (walk-in, pre-booked, or referral) had a measurable impact on how long patients waited for care.

Table 7

Pairwise Comparisons of Type of Visit Schedule

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Pre-booked-Referral	-66.036	20.624	-3.202	.001	.004
Pre-booked-Walk-in	106.590	16.042	6.645	.000	.000
Referral-Walk-in	40.554	15.807	2.566	.010	.031

In relation to Table 7 above, each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level of 0.05. Significance values were adjusted by the Bonferroni correction for multiple tests. To examine whether outpatient waiting time differs based on the type of visit schedule Walk-in, Pre-booked, or Referral tests for normality and homogeneity of variances were conducted. Both the Kolmogorov–Smirnov and Shapiro–Wilk tests yielded statistically significant p-values ($p = 0.000$) across all three groups, indicating that outpatient waiting time is not normally distributed for any category of visit type.

The Kruskal–Wallis test, a non-parametric alternative to ANOVA, revealed a statistically significant difference in outpatient waiting time across the three visit schedule categories ($\chi^2 = 46.44$, $df = 2$, $p < .001$). This implies that the type of appointment whether walk-in, pre-booked, or referral is significantly associated with variations in waiting time.

4.6 Regression Analysis of Staff Availability across Service Points as Predictors of Outpatient Waiting Time

This section summarises the findings of a regression study undertaken to assess the predicted link between staff availability across various service points and outpatient waiting times in the selected public health institutions. The study sought to determine if variations in the quantity and distribution of healthcare personnel such as receptionists, triage nurses, clinical officers, laboratory technicians, and pharmacy personnel have a substantial impact on the overall waiting time experienced by patients. By evaluating these relationships, the study hoped to quantify the influence of personnel sufficiency and deployment efficiency on patient flow and service delivery results. The findings provide

empirical data to support staffing optimisation techniques and educate health-care management decisions targeted at lowering wait times and increasing patient satisfaction in outpatient departments.

Table 8

Regression Analysis of Staff Availability across Service Points as Predictors of Outpatient Waiting Time

Model		Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.	Tolerance	VIF
1	(Constant)	1.619	0.324		4.991	0.000		
	Nursing/Clinical Station	0.100	0.131	0.041	0.763	0.446	0.869	1.151
	Doctor's Room	-0.048	0.112	-0.025	-0.427	0.669	0.728	1.374
	Pharmacy	0.040	0.109	0.020	0.363	0.717	0.818	1.223
	Laboratory	0.140	0.086	0.088	1.635	0.103	0.839	1.192

The independent variables included the staff availability at the nursing/clinical station and doctor room, pharmacy and laboratory. An intercept value of 1.619 ($p < 0.000$) was obtained using the model, which depicts the anticipated waiting time of outpatients, when there is no staff availability at all the service points or when the staff availability is zero at all points.

None of the predictor variables was statistically significant at the 0.05 level. The staff availability of the nursing/clinical station was found to have a small, positive yet non-significant correlation with the waiting time (B = 0.100, p =0.446) and this implies that the waiting time is slightly increased in the presence of staff at the nursing/clinical station. Equally, there was a minor positive relationship and no statistical significance between staff availability in the pharmacy (B = 0.040, p = 0.717) and laboratory (B = 0.140, p = 0.103) and waiting time. However, the staff availability in the doctor's room reported a small negative correlation (B -0.048, p= 0.669) which suggests that waiting time may decrease when the doctor is available, yet there was no statistical significance in this relationship as well.

The diagnostics of multicollinearity revealed that there was no multicollinearity since all of the Variance Inflation Factor (VIF) were between 1.151 and 1.374 with the tolerance values being significantly larger than 0.1. This shows that the variables incorporated in the model were not correlated strongly hence suitable to be analyzed in a regression analysis.

4.7 Discussion

This study outlines the existing problems on patient waiting times in outpatient departments within Lusaka's public hospitals and at the same time extend strategic interventions that are consistent with the existing policy frameworks in Zambia. The participants repeatedly stated that three to five hours of waiting is an unacceptable period of time that can be effectively decreased with the help of effective systemic redesign. This observation aligns with the concept of Health Services Quality Improvement Framework (2019-2023), according to which patient satisfaction and timely access are qualitative attributes that must be considered key quality indicators (Villegas et al., 2021). Particularly, the respondents supported the implementation of the SmartCare, the electronic health record system that serves the Republic of Zambia, as a means of making the patient registration process simpler and reducing the waiting times to help the country comply with the principles of the National e-Health Strategy (2017-2021), which treasures the idea of clinical records digitalisation and efficiency of the offered services (Bolton Moore et al., 2022).

The shortage of personnel and inefficient distribution of tasks proved to be some of the salient factors that contributed to the prolongation of waiting times. The given finding is in line with the National Human Resources for Health Strategic Plan (20202030) that cites poor staffing as one of the major bottlenecks of service delivery and, accordingly, suggests maximizing the role of augmentation in recruitment, the fair distribution of workforce, and rotating tasks to enhance efficiency (Ministry of Health, 2020). The participants indicated the importance of additional staffing of the frontline during peak hours and, in that way, supported the need to adopt practical human resource policies in the facilities (Ministry of Health, 2021). At the same time, the use of manual registration and triage systems was also mentioned several times to cause inefficiencies, which the National Health Strategic Plan (2022-2026) refers to when describing service delivery bottlenecks as the hindrance to universal health coverage (Ukonu et al., 2024). Despite policies that promote digitisation and simplified triage models, the accounts of participants show that there is no balanced implementation of measures in different facilities.

Another important issue that was raised was of the need to increase the number of human resources in the health sector. According to the respondents, the lack of physicians, nurses, and ancillary staff was found to be a source of long waiting hours and especially during periods of high traffic. This point can be echoed by the National Health Policy of 2012 which sees sufficient human resources as a cornerstone of health system empowerment (Ministry of Health, 2021). With the operational policies on recruitment in place, there are still issues that hinder operationalisation of these directives even in congested urban areas like Lusaka. Furthermore, the interviewees advised to revive the structured

appointment systems along with the patient flow management with the digital means, thus, in line with the goals of the e-Health Strategy (2017-2021) and the current SmartCare integration. However, adherence and cultural resistance to the systems of appointments have been noted, highlighting the need to implement health education and technology-induced surveillance to provide the maximum adherence (Beck et al., 2021).

Poor infrastructure was also cited to be one of the major causes of long queues. Such bottlenecks increase the length of stay costs to patients by overcrowded waiting areas, a lack of seats, poor ventilation, and insufficient number of consultation rooms (Ministry of Health, 2021). These assumptions are confirmed in the National Health Strategic Plan (2022-2026), which argues that the infrastructure of city hospitals is not enough to provide primary care to the population and requests making investments in the inpatient departments (Ministry of Health, 2021). It is also further demonstrated by the fact that patients are frequently concentrated either in the mornings or on Mondays, demonstrating the mismatch of capacity and patient behaviour in the facilities(Bolton Moore et al., 2022). In line with the Health Services Quality Improvement Framework (2019-2023), the participants proposed adopting adaptive staffing frameworks to recruit more employees during the times of peak patient flow, which is relevant to both pragmatic and cost-effective ways of managing the overflow.

Despite the fact that the emergency cases should be prioritized, the participants noted the necessity of protocols that will reduce the uproar to the regular outpatient flow (Ministry of Health, 2017). This position corresponds with the Emergency Preparedness and Response Policy of 2017, which is aimed at systematic means of the continuity of vital health facilities in the periods of emergency. Furthermore, it has also been noted that a clear policy on outpatient waiting times is lacking; the participants noted that the available guidelines have the problem of focusing on the challenge of overall quality improvements, as opposed to the willingness to concentrate it on the specific problem. This gap highlights the importance of clear national principles that regulate the waiting times provided by outpatients in the overall Zambia Universal Health Coverage agenda (Oladele et al., 2020).

Synthetically, the results of the study are aligned to the current policy on health in Zambia but reveal gaps in implementation; especially in the areas of human resource, infrastructure, digital uptake, and explicit policy provisions on wait times. The suggestions based on the insights of the participants indicate that even the frontline opinions may be used as the potential input to the national policy and, as a result, provide the chance to create a context-specific, implementable, and constantly monitored national framework of outpatient waiting time (Ministry of Health, 2021).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The long queues of outpatients in the first-level public hospitals in Lusaka have remained a serious issue of concern and it is an indicator of the greater system inefficiency in the health system. The results of Kanyama and Chilenje Hospitals indicate constant overcrowding and time wasted in operations which adversely impact patient satisfaction and overall service delivery. These findings show that there is a clear necessity to make specific interventions that can improve the process of patient flow and the efficiency of the work of outpatient services in general.

5.2 Recommendations

This study suggests optimising procedures by doing systematic workflow and service delivery audits to find bottlenecks in service points, registration, and consultation. Then, processes should be redesigned to reduce delays. By adding more employees at busy times and making sure there are enough administrative and medical resources to handle patient numbers, it further emphasises resource allocation. In order to prioritise critical patients and distribute patient flow uniformly throughout the day, the research also supports the implementation of efficient appointment and triage systems.

It also emphasises the significance of developing healthcare personnel' ability via ongoing training in patient flow management, time management, and service quality enhancement. Furthermore, in order to reliably evaluate outpatient waiting times and provide evidence-based management data, monitoring and evaluation tools like time-motion studies or electronic tracking systems should be employed. Lastly, in order to avoid crowding during peak hours, patients should be informed about the best times to attend and the services that are offered.

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